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AUTHOR	Tessier, Judith A.
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ABSTRACT

Network services for library education and research should include access to: documentation and personnel in combination for research and education and instructional laboratories, instructional packages and testing, and curriculum information for education and computer-based facilities for research. An ideal network, current networks and facilities that could be used in a network, and proposals for network activities and research are considered in the framework of service needs. Technical and cost requirements are excluded as secondary to setting objectives. Experimentation on networks is considered only in the frame of a service network. The ideal network would provide access to information services throughout the library education and research field. Learning and research would benefit by combined services where possible. The network should serve students, instructors and researchers, take advantage of current local facilities and spark coordinated innovation. (Other pages from this conference are available as LI 003360 - 003371 and LI 003373 through LI 003390) (Author/NH)

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NETWORK SERVICES FOR LIBRARY EDUCATION AND RESEARCH

by

Judith A. Tessier, Syracuse University
School of Library Science

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ABSTRACT

Network Services for Library Education and Research. Judith A. Tessier, Syracuse University, School of Library Science, Syracuse, New York 13210. Fall 1970.

Network services for library education and research should include access to: documentation and personnel in combination for research and education and instructional laboratories, instructional packages and testing, and curriculum information for education and computer-based facilities for research. An ideal network, current networks and facilities that could be used in a network, and proposals for network activities and research are considered in the framework of service needs. Technical and cost requirements are excluded as secondary to setting objectives. Experimentation on networks is considered only in the frame of a service network.

The ideal network would provide access to information services throughout the library education and research field. Learning and research would benefit by combined services where possible. The network should serve students, instructors and researchers, take advantage of current local facilities and spark coordinated innovation.

Review of the literature reveals a scarcity of current activities that might be used in a network. Costs to develop instructional laboratories and packages discourage experimentation locally. Bibliographic coverage of the field is uneven. Informal channels of communication have not been assessed.

Proposals include research to describe information seeking patterns in library research and education and to provide a base for planning national services, and four pilot networks to meet current needs and to provide data. The pilot networks for education focus on the subject areas: computers in libraries, service to the disadvantaged, and international librarianship; a pilot telephone network for researchers is suggested.

NETWORK SERVICES FOR LIBRARY EDUCATION AND RESEARCH

Librarianship is in a time of critical change. Library education is inadequate.[1] The research and literature of library science does not provide the information we need to plan and implement library services. The National Advisory Commission on Libraries called for interdisciplinary and specialized research, training and service.

Library education and research are at the center of the change process. They provide the knowledge and training which should influence libraries for the next fifty years. Library educators must identify and integrate the different bodies of knowledge their graduates will need to meet the challenge of the future. Researchers must begin to undertake studies which will lead to the development of a cumulative body of knowledge--studies which will contribute to the development of theory.

Library education and research sorely lack the resources to generate and transmit the required knowledge of librarianship. Lack of qualified library instructors, the inadequacies of library school facilities, inappropriate training programs, and the need for a clearinghouse on library education innovations are major impediments to progress. Needs for specialized training and for personnel from social, behavioral

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[1]The problems posed here are cited in the National Advisory Commission on Libraries, "Library Services for the Nation's Needs: The Report of the National Advisory Commission on Libraries," in Douglas M. Knight and E. Shepley Nourse, Libraries at Large (New York: R.R. Bowker, 1969), p.515-519.

and applied sciences only increase stress on already scarce resources.

The need for basic theoretical work in library and information science requires a coordination of effort by a variety of researchers from many fields. Research of human and technical variables is required. Yet, there is now no system for communication among researchers in different locations and in different fields; there is no concerted effort in organizing, disseminating and reviewing the literature in some parts of the field.[2] Moreover, there has been no attempt to ascertain the needs of researchers in library and information sciences, or to describe their information seeking patterns. Library researchers have been urged to provide insights into the services required by other researchers, but are asked to do so without the bibliographic and communications tools posed as necessary for other researchers.

Coordination and sharing of personnel and materials may provide one solution to the scarce resources in library education and research. Making materials and personnel from one institution available to all the institutions in the group is an alternative to competition for scarce resources. The establishment of an information and communication network for library education and research is one means of attempting to deal with the "knowledge explosion."

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[2]The American Society for Information Science is the exception. Through their information services and evaluation program, the Society provides some information services to the librarians represented.

This paper explores the potential uses of networks in library education and research. The term network will include any activities having two elements: 1) formal agreement between two or more library education or research institutions to share stated resources; 2) communication links used to meet the objectives of the agreement. Using this definition, agreement to share library materials and use the mails for interlibrary loan qualifies as a network activity; hiring an instructor from another library school as consultant does not.

After a few qualifications are stated, an ideal network for library education and research is described and those information requirements that are recognized today are listed. The two-part network definition--formal agreement and communication as a minimum--and the ideal system can then be used as two ends of a continuum to assess current and proposed network activities. An inventory of current networks and of current activities that might become the focus for network service follows. Finally, specific network activities and research are proposed as beginning steps to the establishment of an adequate information network.

Two considerations in planning a network for library education and research are not included in this discussion: costs and technical requirements and network research. Costs and technical requirements will be major considerations in implementing the recommendations here; however, it was felt that these considerations were secondary to the need for a

statement of network objectives and could not be assessed until agreement was reached on needs and priorities for service. The second exclusion, network research, has been subordinated to service networks for researchers. The discussion of facilities for network research is a subtopic here, and should be considered in its own right, including the research requirements suggested by this conference.

Information services for education and research are assumed to be currently inadequate. The coordination and sharing of resources is a necessity. Trends to specialization and interdisciplinary work will continue. The pilot projects recommended in the last part of this paper are based on this last point; the projects are designed to take advantage of specialized curriculum, e.g., computer applications in libraries.

Education and research are treated together in most of this paper. Combining the two is not an attempt to confuse them or to slight the needs of either. Information and communication for both education and research are considered.

A network for library education and research provides unique benefits. It can be a testing ground. The library specialist and sometimes the system manager are also clients of this network. The user role may provide insights that are overlooked from the service side of the desk or that have been unobtainable when relying on user reports. In information retrieval studies, the sample data bases are sometimes files

for information retrieval literature, the researcher's own specialty; networks for library researchers and educators follow the same principle and reap the same benefits. Also, the student user may become the system manager, with the benefit of his experience in the client role.

Ideal Network

The ideal setting for education and research is an environment in which students, instructors, and researchers are no longer limited to their own institutions when seeking information, but instead are able to call for, and receive information and discussion with people anywhere in the library education and research fields, and those in library service, on reasonable need. It is also a setting in which the researcher, instructor, and student can provide information or consulting services to others, and can work on joint projects with others in distant places. The ideal setting, in short, is one in which each person acts as a free agent in a pool of materials, facilities and personnel that make up the intellectual core of librarianship.

An information system in this environment might provide both bibliographies and documents by linking library science and library research collections. It might provide the mechanisms for transmitting videotaped lectures to a school that has no instructor in, for example, special librarianship. Perhaps most intriguing is the possibility of using communications links freely to bring geographically distant people

together for consultation or joint projects. A network might also develop facilities which a single institution cannot fund easily, for example, computer-based laboratory for instruction in information systems or for research on networks.

Generally, library education inadequacies fall into five classes: 1) bibliographic resources; 2) laboratory facilities; 3) instruction, instructional packages, and evaluation of instruction; 4) curriculum content, description, and implementation; 5) library education personnel (National Advisory Commission on Libraries, 1969). These inadequacies have prompted local responses in specific subject areas: collections in international librarianship (Brewster, 1968), laboratories in computer systems (at Syracuse and the University of California, described below), and programmed instruction in cataloging (Monroe, 1970). The needs now are to provide access to what is available in particular schools and to coordinate the development of new resources.

An ideal network for library education would provide the links to share existing resources and to develop new ones in the following ways:

1) bibliographic resources: bibliographic listings from member institutions and literature clearinghouses, and document transmission, including non-book materials; coordination of collections through cooperative buying in specializations by type-of-library, or service, or media.

2) laboratory facilities: instructional laboratories in subject areas where hands-on experience is helpful; centralization of laboratories where feasible, especially for an on-line computer-based laboratory with programs and data bases typical to library operations and information science research.

3) instructional packages, specialized instruction and evaluation of instruction: live lectures by television with two-way voice transmission; access to computer-based instruction housed in other institutions, (e.g., computer assisted instruction in cataloging); and telephone ties to coordinate research in teaching by linking educational specialists and library instructors (for example, for management teachers and experts to compare content, styles, and objectives of management courses and to develop and test packages for a course in management over a set of student groups).

4) curriculum information and coordinated innovation: documentation on curriculum, objectives and implementation; access to the documentation by keywords, to avoid information lost in course title listings; analysis of current offerings and innovations; a communication link to allow discussion of planned changes in curriculum with personnel in other schools; analysis of network use by schools for data for curriculum change at individual schools.

5) library education personnel: directory assistance and at least telephone to provide easy informal consultation between

instructors or students and instructors; use of this channel for beginning the coordination of efforts in 1, 2, 3, and 4 above.

The communication links in such a network would need to allow for a variety of media, including human communications, videotape transmission, document transmission, and digital transmission.

Library research requirements can be divided into three classes: 1) bibliographic resources; 2) computer-based research facilities; 3) communication links between research personnel. A network could provide the following services:

1) bibliographic services: control and access to library related literature, with particular emphasis on research report literature; an individualized alerting and request service for current literature in areas selected by the researcher.

2) computer-based research facilities: Directory to, and access to, data and programs at two levels: a) to facilitate the researcher's particular projects, for example, with statistical test programs, data from comparable studies, and supporting data generated elsewhere; b) to provide a central store for coordinated efforts, with input and editing capabilities, for example, in research on computer-based information systems, where descriptive data and test programs are needed. Testing of computer facilities and network facilities are two areas for coordinated efforts.

3) research personnel: Directory to, and access to, research personnel for consultation and coordinated work. Equipment for voice, document and digital transmission would be necessary.

A problem in planning a service network for education and research is to define the appropriate services for both educational and research components and those services appropriate only to parts of the population, and then to provide coordination of the services. It is a problem when particular subject areas are considered. Yet, there are benefits from a combined service where possible. The researcher, with his in-depth but specialized knowledge, would benefit from the breadth required of a teacher, and from the sometimes perceptive curiosity of the student; they, in turn, can benefit from his mastery of his research area. Combined bibliographic services and personal contact services would reflect both the needs for breadth and for depth of the specialist and the generalist.

The problem of defining appropriate service interrelations can be indicated by the example of services in the content area of networks. One area of research is information systems and network research; one area of instruction is information systems and networks. Network and computer laboratories are required for both instruction and research, but with different ends in mind.

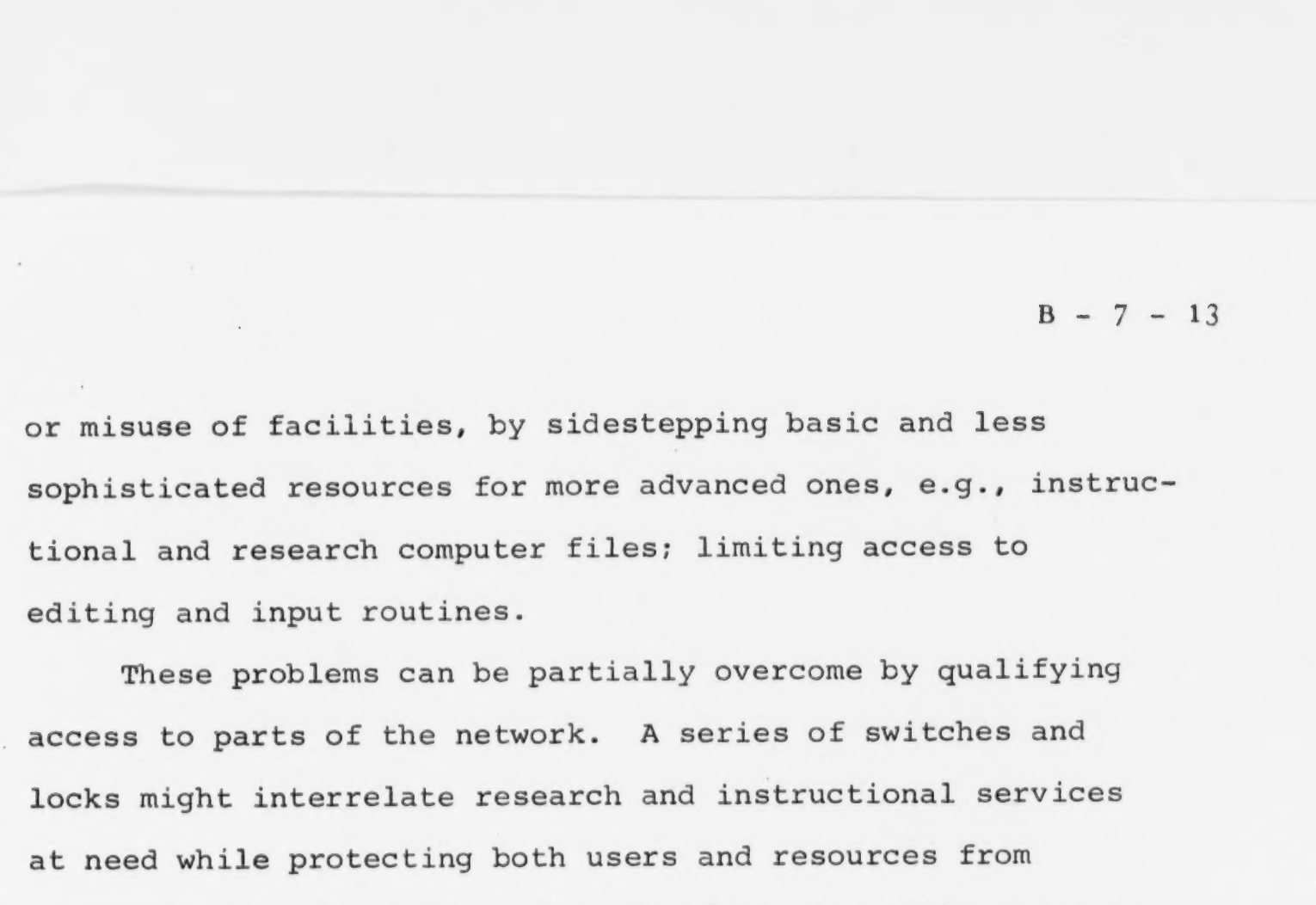
In this case, the following interactions might occur.

Network research may provide the personnel for planning the network services for library education, and specifically for the instructional network laboratory. Research into user requirements, the technologies required, the appropriate access points will require the skills of network researchers. In turn, library educators will need to cite priorities for the laboratory, and some will be both managers and users of the pilot systems. Instruction, moreover, will use the findings of network and computer research in teaching about networks and computer systems. The research facilities themselves may provide a laboratory for advanced students; and advanced students may become personnel on research projects. The interaction is first in development, when the researcher provides his specialized skills in planning and implementing services. It continues through interaction of personnel and literature by individuals. Formal interaction might continue when advanced students use research facilities. Network researchers might be actively involved in planning the service network generally; specialized researchers would interact with education personnel primarily in their subject areas.

Yet, the interaction of research and instruction activities builds in serious problems for the information network. Some problems are: imbalanced resources, where particularly strong schools or institutes support the weaker ones, e.g., through collections or well-known personnel; overreaching,

or misuse of facilities, by sidestepping basic and less sophisticated resources for more advanced ones, e.g., instructional and research computer files; limiting access to editing and input routines.

These problems can be partially overcome by qualifying access to parts of the network. A series of switches and locks might interrelate research and instructional services at need while protecting both users and resources from inappropriate use, or overuse. The following table suggests a series of combined and separated educational and research network services.



The ideal system would serve most specializations in librarianship under one umbrella, with some links for specific activities, e.g., research editing capabilities would usually be limited to particular ongoing work. Clustering of activity would be, probably, around areas such as type-of-library-specialization, service areas, or media; the break-down into five service needs for education and three needs for research cuts across the subject areas and may be applicable in each particular area. The development of the network approaches the interconnection of personnel and resources by subject specialization. The considerations which prompted this are described in the last section.

Potential Network Components in Current Activities

Some attempts have been made to develop new instructional materials, new facilities, and networks to support education and research needs. The projects listed in this section are highlights of current activities and have been chosen because there is potential in each for use by more than one institution. The list was developed by a literature search and personal contact. No doubt some activities were missed; the search for activities yielded surprisingly few innovations. There are two types of service facilities included: instruction and research facilities which now serve one institution or a few through informal channels; embryonic networks that may provide focus for network activities.

1. Bibliographic resources. "There is no one service (or

group of related services) to which one can turn to receive reliable coverage on current information." (Conf. on Bibl. Contr., p. 7) Two new activities are beginning work at controlling parts of library science literature: The ERIC Clearinghouse for Library and Information Sciences (CLIS) operated by the American Society for Information Science (ASIS) indexes and sells copies of research reports and other documents on the operation of libraries and information centers, related technology, and educational research. The Clearinghouse lists may eventually be available in machine readable form through the LEASCO Corporation, under agreement with the Office of Education (ERIC files, 1970).

The Discussion Group for Library Science Librarians, a section of the American Library Association Library Education Division (ALA/LED) circulates accessions lists and want and surplus lists for library school library collections. The group is informal and has little financial backing.

2. Laboratory facilities. LEEP (Library Education Experimental Project), Syracuse University School of Library Science, was designed to test the use of MARC records in library education. The MARCI records were used initially, and the IBM Document Processing 360/50 package has been the strongest retrieval program. LEEP personnel are writing an on-line retrieval program for MARCII. The laboratory was conceived as a flexible instructional tool. It has been used for assignments in a variety of courses. Students have done research on MARC records and their applications and on

retrieval processes. Pratt and Drexel Library Schools are using LEEP through the mails. The Minnowbrook Conference, sponsored by LEEP, highlighted library automation as a focus for cooperation (Atherton and Tessier, 1970).

The Institute for Library Research (ILR), University of California at Los Angeles and Berkeley, is an umbrella institute for library research. Two specific projects show promise for library instruction and network use: the Information Processing Laboratory and the File Organization Project. (Final reports out Fall, 1970, M.E. Maron, Director). Facilities include: a series of machine-readable files and associate retrieval programs; a computer program called REF Search for reference instruction, including indexed reference tools and routines to test students on each title; a computer-assisted instruction (CAI) program and lab exercise for subject cataloging, in the testing stage; and on-line terminals in the laboratory. Interaction between research and instruction has worked successfully at ILR, partially through the crossing of personnel between the school and the institute. The research files are available for doctoral research and for classroom assignment.

The Comparative Systems Laboratory at Case Western Reserve (Saracevic, 1968) studied the evaluation of information retrieval systems and was the focus of a special course in information retrieval systems.

The pilot Educational Information Network (EDUCOM) may

eventually provide access to programs and data bases through their directory service to EDUCOM members.

Of those cited, only LEEP, and part of ILR, were originally funded as education projects. High costs in setting up laboratories has limited new projects and the implementation of networks for those now established. The need to share costs across as many users as possible makes this a prime area for networks.

3. Instructional packages and testing, aside from LEEP and ILR. Personnel at the University of Michigan, School of Library Science, have written programmed instruction in reference books and computer-based routines for reference exercises on specific titles; the packages are being tested now. (Slavens, 1970)

AIM Project, University of Wisconsin, attempted to develop programmed instruction for four areas of library instruction: reference, cataloging, library materials, and library management and operations (Monroe, 1965, 1968). The cataloging course was completed and will be available through McGraw-Hill. The project lacked the funds and personnel to complete other courses. A controlled experiment to test the cataloging course, using separate campuses and sections in experimental and control conditions, is especially interesting. It is an example of coordinated research in library instruction. Library educators in other schools worked with AIM in evaluation of the cataloging text.

Other activities of note: use of closed circuit television for instruction at the University of Pittsburgh (Phillip Immroth) and radio for extension courses at Wisconsin (Muriel Fuller).

In most cases, developing packages has meant working with educational specialists or computer specialists. Testing has been a costly but critical part of some development projects. Again, costs tend to discourage these efforts and to press for wide use of tested packages.

4. Curriculum development. Any school working on curriculum revision must now contact individual schools, if they want comparative information. School catalogs are the only systematic descriptions available now. Reports to the Committee on Accreditation are not public. The result is duplication of survey and development effort. Lack of documentation may result from lack of time, an unwillingness to document problems and doubts, or lack of a clearinghouse.

Informal communication undoubtedly plays a major role in cross school discussions on matters of curriculum and faculty. Communications are now served through the Association of American Library Schools (AALS), the Library Education Division and Library Research Roundtable of ALA, the American Society for Information Science, and regional association meetings and institutes. Students in upstate New York have generated a mailing list and agreements to share common concerns about library education.

5. Directories and access to personnel. The Committee on Institutional Cooperation, Conference Group on Library Schools, includes these universities: Chicago, Illinois, Indiana, Iowa, Michigan, Michigan State, Minnesota, Northwestern, Ohio State, Purdue, and Wisconsin. This cooperative venture started through the parent universities and has percolated down to the library schools. The group has listed their current research for their own uses. They are now proposing a feasibility study for a network for experimentation on network problems. They have exploited the existing links between their institutions and have been able to incorporate the ideas of the potential participants at the beginning of the project. The respective libraries and library schools may act as nodes in the experiments. Source: Miles Libbey, Indiana University.

The University of Maryland (Paul Wasserman) is preparing a research in progress file, to be published Fall, 1970.

Listings of library educators are maintained by the AALS Journal of Library Education directory. The lists are classed by subject areas, schools, and names.

The informal communications that are the foundation of cooperative activity occur through contacts at conferences. We know little about the effectiveness of these meetings for beginning and maintaining informal contacts.

In summary, library education and research are not engaged in many activities that are network activities.

Moreover, the services suggested for a service network are not now available. However, there have been developments that could be adapted to networks, and which suggest areas of strengths that might be most profitably pursued. The information systems laboratory for instructional purposes is one such area of need and strength; the computer-based reference course is another.

A Service Network for Library Education and Research: Development

A two part program is needed to begin to develop a service network for library education and research. A research program should describe current information seeking patterns of the population such a network would serve. In tandem, a series of pilot networks should be tested, each network should cluster around a subject area of library science, and include institutions strong in that area and institutions with recognized needs in that area. One for research should provide basic communications.

Research program. A research program should be supported to assess the requirements for information and the information seeking patterns of the proposed client groups. The research sample should include students, library educators, and researchers. This work should begin to answer the questions of user needs and alternative services. What are current information seeking patterns in library education and research? Can we measure the effectiveness of these? Are there alternative services needed? Can we develop a

set of priorities based on the current behaviors and the opinions of proposed clients? This research program has two purposes: it provides information for planning the complex system; and the process of assessment may involve a broader base of interested and committed personnel.

Establishment of a communications and information network, for access to personnel, data, and information resources, presupposes a need for such a network. The needs for information systems for education and research have been recognized, although not in the network context ("ASIS Information Program Developments," 1970). Yet we have no data to indicate what specific information needs in library education and research are. Information seeking in the research process, for example, and the role of communication among researchers cannot be described now with any degree of confidence.

The American Psychological Association's studies on the information exchange of psychologists (Allen, 1969) provide a model for describing the complex information system of a profession. Like their studies, the concern here is to provide a description of a variety of activities. Information seeking activities are those of concern. In this case, the research team should consider the sources of information used by the student, the instructor, and the researcher in library science. The sources are then assessed in terms of ease of access, effectiveness, speed, and cost for the user. The decisions

the users make in selecting one source of information over others provide some insights into preferred patterns of access. This research would provide a base statement on current information use patterns.

Parallel work should be conducted on needs, if these differ from uses. Information sought, but not found, information found but which the searcher has low confidence in, provide some clues. The stated needs of researchers, educators, and students should be sought also.

After this preliminary work has been done, we will be able to state with more confidence what alternative services are needed. We will be able to indicate services best met by network activities and have base measures to test network effectiveness. We will have some estimate of value for investment. The research might also provide a set of priorities to use in implementing the complex system.

A second research area has implications in building a national information network for education. The questions center about designing a system that allows for local flexibility in curriculum while using national resources for general services. The scarcity of funding makes this a serious issue. As a network sets priorities, it will be applying resources to particular areas of instruction, perhaps to the consternation of some schools. Another way to ask the questions is: what agreements can be expected locally and what impact will national services have locally?

Then, how can the commitments of individual schools be translated into a balanced network?

These two behavioral considerations have been cited as research problems, since a proposal of networks for library education and library research is essentially a proposal to change behavior or the effectiveness of some behaviors. This research program will provide part of the base on which we can implement and measure network services.

After the research is completed, feasibility studies, pilot projects, and service implementation will follow more rationally. The particular focus for network activity may be either national information services, or critical services to particular subsets of the education and research population. The smaller, pilot networks could in turn be combined and built upon toward the ideal network goal. It may be that a combination of imposed national services and locally generated networks will be the result.

Pilot networks. Because particular areas of library education and research are seriously inadequate now, three specific proposals for pilot education networks and one for research are given below. These proposals serve as examples of the locally generated networks that should be encouraged as tests for more ambitious projects and as needed services. By monitoring these, we have contrasts to the information sources available now, and can supplement the research suggested above.

1. Computer-based laboratory. Library students need instruction in computer applications in libraries. The need is for a flexible, graded laboratory experience, closely simulating

computer systems in libraries. Laboratory instruction should include explanatory materials where these are not available locally. Exercises should include decision-making, use of management data gathering programs and evaluation of student results. One laboratory, with a computer, could provide the necessary technology, data bases, and programs for retrieval, workspace maintenance, file generation and input and output, for a set of schools with terminals. The facility would need ongoing instructional evaluation for planning and revision. A network of not less than five schools, with heterogeneous orientations, might provide the pilot setting.

2. Education for service to the disadvantaged. Personnel are probably the critical resource in training for service to the disadvantaged. Both instructors and students need theoretical understanding and practical experience. Few schools can provide both the service experience and the faculty. Short term placements for students, and telelectures from qualified instructors may be one solution. A small set of schools, including those with coursework or research into service with the disadvantaged, would provide testing ground for telephone and sometimes television access to personnel on other campuses. Cooperation in such a sensitive and current need area might also provide the skepticism needed for quality control. That is, by working with other schools, those now beginning specialized programs would be challenged to defend their programs and to weigh alternative programs.

3. International librarianship. Cooperation in the form of training, placement abroad, and shared monitoring and returnee debriefing would provide a service needed in library education but which no one school can support.

Other areas for networks might center around schools noted above that have developed instructional packages, or around media programs, or type-of-library-specializations. A series of such networks, each centered about one area of curriculum creates as many problems as it solves. This developmental process, however, provides a basic ingredient to continued networks: each network focuses on an area of need; membership is on the basis of commitment to the need, and thus provides the momentum so far lacking in library school cooperation. Volunteer activity takes into account the library schools' needs for flexibility and autonomy. It can be suggested that beginning networks in one area of curriculum will lead to coordinated efforts by the same schools in other areas of the curriculum.

4. Research network. Informal communication among researchers is probably inadequate now. This proposal is interim, and is suggested in part to provide comparative data. During the planning phases of particular research projects, the researcher should be provided with means of discussing ideas with colleagues, not necessarily in his own institution. A free telephone line might be all that is required. A more formal way of encouraging coordinated efforts is through institutes and traveling fellowships; these however, are not potential network activities, or

ongoing service.

In summary, requirements for information services in library education and research suggest that a national network is necessary. Planning such a network, however, requires information we do not have. Nor do we now have projects that can provide models for proposed services. Library education particularly has not shown leadership in cooperative ventures. Local considerations may continue to remain most important to library schools.

Balanced against these impediments to network implementation are the serious inadequacies that have not been solved locally. With increasing specialization and interdisciplinary work, the interconnection of researchers, educators and students will become even more necessary. Benefits unique to network services for library education and research include the dual user-manager role and student recruitment into network specialization. More important, our ability to service national information needs will in part depend on the effectiveness of our own information system.

The development of a national library education and research network is an evolutionary process. Bibliographic services might be imposed from the national level. Other services, generated on a lower level around subject areas of librarianship, might be combined with national services and eventually provide balanced access to the knowledge of librarianship.

Information seeking patterns in education and research should be described and needs assessed. A series of priorities for national service should be stated. In tandem, pilot projects for education and research should be encouraged, to provide services needed now. These pilot projects should be studied for their implications to a national network. Systems evaluation and instructional evaluation should be given to major emphasis in planning and funding pilot projects. Communication, basic for the implementation of a network through pilot projects, should be improved to link specialists conveniently and at minimal costs.

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